

Amendment under 37 C.F.R. §1.111  
Attorney Docket No. 062924  
Application No. 10/598,185

### **REMARKS**

Claims 2, 4-7, 9, 12-19, 21-24, 26, 29-32, and 36 are pending in the present application. Claims 1, 5, 9, 19 and 26 are herein amended. Claims 3, 8, 10, 11, 20, 25, 27, 28 and 33-35 are herein canceled. Claim 36 is newly added.

### **Claim Objections**

Claims 25, 26, 33 and 34 were objected to because of informalities.

The Office Action states that claims 25 and 26 recite the same limitations. Claim 25 has been cancelled.

The Office Action states that claims 33 and 34 do not recite limitations. Claims 33 and 34 have been cancelled.

Withdrawal of the claim objections is requested.

### **Claim Rejections – 35 U.S.C. § 112**

Claims 33 and 34 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Claims 33 and 34 have been cancelled.

Withdrawal of the claim rejections under § 112 is requested.

### **Claim Rejections – 35 U.S.C. §§ 102 and 103**

Claims 1-7, 10, 11, 14, 17-24, 27, 28, 31 and 35 were rejected under 35 U.S.C. § 102(b) as being anticipated by **Franzen** (US 2005/0017167); claims 8, 9, 25 and 26 were rejected under 35 U.S.C. § 103(a) as being unpatentable over **Franzen** in view of **Franzen2** (US 2005/0017165); claims 12, 13, 29 and 30 were rejected under 35 U.S.C. § 103(a) as being unpatentable over **Franzen** in view of **Reinhold** (US 6,483,109); and claims 15, 16 and 32 were

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rejected under 35 U.S.C. § 103(a) as being unpatentable over **Franzen** in view of **Ding** (US 7,193,207).

Favorable reconsideration is requested.

Claim 1 has been amended to include the limitations of claims 3 and 8. Furthermore Applicant restricts “voltage levels” to “DC voltage levels.”

Applicant respectfully submits that Franzen and Franzen in view of Franzen2 do not teach or suggest:

switching a trapping voltage between two discrete DC voltage levels to create a digital trapping field for trapping precursor ions and product ions in a trapping region of the ion trap

as recited in amended claim 1 and similarly recited in claims 9, 19 and 26.

Franzen and Franzen2 disclose the use of RF voltage to inject electrons into a linear ion trap and do not disclose the use of two discrete DC voltage levels to inject electrons into a 3-D quadrupole ion trap as recited in amended claims 1, 9, 19 and 26.

Applicant also notes that Franzen2 discloses injecting electrons through a perforation in the end cap electrode or through the gap between the ring electrode and the end cap electrode. In contrast, the present invention uses a hole in the end cap to inject electrons into the ion trap. Using a hole in the end cap electrode has an advantage as stated below.

As the potential of the end cap electrode is usually at the ground level, one can treat the end cap electrode in a similar way to the field around the ion trap, which enables easy control of the electron beam outside the electrode in the present invention. Furthermore, the electron beam can be focused at a target due to the symmetry of potential distribution inside the ion trap

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because electrons are injected along the central axis. In contrast, the injection of electrons through the gap between the ring electrode and the end cap electrodes does not produce symmetry of potential distribution inside the ion trap.

Claim 5 has been amended to change "ion trap" to "3-D ion trap" and "three discrete voltage levels" to "three discrete DC voltage levels." New claim 36 also recites these noted limitations. As noted above regarding claim 1, Applicant respectfully submits that Franzen and Franzen2 disclose the use of RF voltage to inject electrons into a linear ion trap and do not disclose the use of three discrete DC voltage levels to inject electrons into a 3-D quadrupole ion trap. In addition, Franzen discloses a "linear ion trap."

For at least the foregoing reasons, claims 1, 2, 4-7, 9, 12-19, 21-24, 26, 29-32 and 36 are patentable over the cited references. Accordingly, withdrawal of the rejection of claims 1, 2, 4-7, 9, 12-19, 21-24, 26 and 29-32 is hereby solicited.

In view of the aforementioned amendments and accompanying remarks, Applicant submits that the claims, as herein amended, are in condition for allowance. Applicant requests such action at an early date.

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicant's undersigned attorney to arrange for an interview to expedite the disposition of this case.

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If this paper is not timely filed, Applicant respectfully petitions for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,  
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